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Trade Deficits and Labor Unions

Myths and Realities

Thomas Karier

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Executive Summary

During the 1980s, the rapid growth of imports sent some U.S. industries reeling, culminating in massive layoffs and plant closings. Although the surge of imports was generally blamed on misguided macroeconomic policies which created grossly distorted exchange rates, all industries were not affected equally. Imports had a particularly devastating effect on some manufacturing industries while leaving others virtually untouched. Although unions are frequently cited as one of the reasons for this failure in international competition, the evidence has usually been anecdotal and unconvincing.

The U.S. has among the lowest unionization rates in the world today. Thus, imports are likely to originate in countries with higher unionization rates. It is especially difficult to argue that unions have impaired U.S. competitiveness when much stronger unions in Japan, Canada, and West Germany seem to have had no such effect.

The best way to ascertain the contribution of unions to import penetration is to compare the characteristics of particular industries. If industries with high import penetration were also consistently highly unionized, one could make the case that the two are related. However, the analysis in this report finds no evidence to support this hypothesis. There is no statistical justification for believing that unions either attract imports or deter exports.

The possibility remains that American unions have caused firms to relocate their production abroad. The effect on U.S. domestic industries could be just as deleterious, causing imports to rise and/or exports to fall. However, a statistical review of industry-level data shows that unionization does not appear to be a general characteristic of the industries which rely heavily on foreign production. Other factors, in particular the degree of monopolization of an industry, seem to be more

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important in explaining foreign investment by U.S. firms.

This report concludes that since unions have not contributed significantly to the erosion of U.S. industrial competitiveness, it must be attributed to other causes.

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Introduction

The deteriorating international position of many U.S. industries in the past two decades has precipitated some important controversies. Among these is whether or not U.S. manufacturers are losing their technological edge in manufacturing high quality goods at low prices. And if U.S. competitiveness really is at risk, are unionized workers partially to blame for pricing themselves out of international markets, in effect "doing themselves in"?

If U.S. competitiveness really is at risk, are unionized workers partially to blame for pricing themselves out of international markets, in effect "doing themselves in"?

Some recent studies have argued that unions make U.S. firms less competitive. For example, a Federal Trade Commission (FTC) staff report, *International Competitiveness and the Trade Deficit* (Hilke and Nelson, 1987), concluded that although high union wages and union work rules did not account for the increase in the U.S. trade deficit in the 1980s, they are still significant factors in explaining import penetration rates in individual industries. Linneman and Wachter (1986, p. 104) asserted that "[L]arge and increasing union wage premiums ... have an important impact on which firms can successfully compete in domestic and international markets." They based their claim on the assumption that higher union wages, generally placed at 20 to 30 percent above nonunion wages, are passed on in higher prices. Therefore, they reasoned that unionized firms should find it difficult to compete with nonunion domestic and foreign firms with lower labor costs.

But how much of the union wage premium actually gets passed on in higher consumer prices? Recent research has called into question the simple assumption that higher wages translate into higher prices. For instance, some of the union wage differential may be offset by higher productivity of union workers (Belman, forthcoming). Several studies cited by Freeman and Medoff (1984) suggest that unionized workers may be more productive than comparable nonunion workers, although most estimates for manufacturing are marred by technical problems involved in separat-

ing productivity from price effects. In any event, these studies illustrate the possibility that higher productivity among union workers could reduce or even eliminate the need for higher prices on goods produced by union firms.

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There is yet another factor that could reduce the need to charge higher prices for union-made products. Numerous studies have shown that a large part of the higher wages paid to union workers are provided by reduced monopoly profits (Karier, 1985 and 1988; Voos and Mishel, 1986a). Every dollar of the union wage premium that is paid for out of monopoly profits reduces the amount passed on in higher prices. If the union wage premium was entirely covered by some combination of higher productivity and lower monopoly profits, the price differential between union and nonunion firms would vanish. Consequently, it is not certain that unions cause a disadvantage in international competition.

This report explores three primary ways in which unions can influence industry trade patterns. First, it is possible that aggregate trade flows between particular countries are affected by international variations in unionization rates. The evidence cited below demonstrates that unions cannot be blamed for the overall U.S. trade deficit, since American unionization rates are actually below those of most of our competitors. Second, unions are often blamed for the poor trade performance of individual industries. The statistical analysis in this report shows that, in fact, unionization rates are not correlated with higher imports or lower exports at the industry level. And finally, unions could indirectly affect trade flows if they increased the propensity of U.S. firms to move production abroad. While this effect cannot completely be ruled out, the last section of this report shows that factors other than unions are more important in driving American firms to invest abroad.

Unions and the Trade Deficit

One obvious symptom of America's problem of competitiveness is the merchandise trade deficit. While conventional thinking assumes that the trade deficit is due only to mismanaged fiscal policies (i.e., the budget deficit) and incorrectly aligned exchange rates, the evidence shows that these explain only part of the rise in the trade deficit in the 1980s (see, e.g., Helkie and Hooper, 1988).

Mismanaged fiscal policies and incorrectly aligned exchange rates . . . Explain only part of the rise in the trade deficit in the 1980s.

It is frequently asserted that a sufficient depreciation of the dollar could always offset declining competitiveness, albeit at the expense of raising the domestic cost of living and thus reducing the standard of living (e.g., Dornbusch, Krugman, and Park, 1989). However, recent experience should give pause to those who attribute the trade deficit mainly to exchange rates. According to conventional wisdom, high U.S. interest rates in the 1980s attracted the attention of foreign investors, who then proceeded to buy dollars to take advantage of these high returns. Through this process, they bid up the relative value of the dollar. The strong dollar in turn raised the effective price of U.S. merchandise exports and reduced the price of imports, leading to the trade imbalance. There were few surprises until after 1985, when the falling dollar failed to reduce imports as readily as the high dollar had increased them. Although the persistence of the trade deficit can be explained partly by the lagged response of demand and limited "pass-through" of exchange rate changes into import prices, the resilience of imports in the face of a devalued dollar was greater than most analysts expected. The failure of conventional analysis to anticipate the asymmetrical effects of a rising and falling dollar serves as a reminder that exchange rates are only one of many factors influencing trade flows.

The question naturally arises whether unions could be one of the other factors affecting the trade balance. Table 1 compares the wages (hourly

TABLE 1

Characteristics of Countries Contributing to the U.S. Trade Deficit

Country	1988 Trade Deficit with the U.S.[a] ($billion)	1988 Hourly Compensation[b] (Dollars)	Percentage Union[c]
1. Japan	52.1	13.14	30 (32)
2. Taiwan	12.7	2.71	18
3. West Germany	12.2	18.07	34 (42)
4. Canada	11.7	13.58	31 (36)
5. South Korea	8.9	2.46	10
6. Brazil	5.0	1.49[d]	50
7. Italy	4.8	12.87	42 (51)
8. Hong Kong	4.6	2.43	15
9. Mexico	2.6	1.57[d]	35
10. Sweden	2.3	16.85	90 (89)
11. France	2.1	12.99	20 (28)
12. Switzerland	0.4	17.94	20 (36)
13. United Kingdom	−0.4	10.56	42 (58)
United States	120.9	13.90	18

[a]Source: OECD, *Monthly Statistics of Foreign Trade*, April 1989, and author's calculations. A negative deficit is a surplus. The U.S. total deficit includes all countries.

[b]Average for manufacturing production workers. Source: *Handbook of Labor Statistics*, Bureau of Labor Statistics, 1989.

[c]Source: *The World Factbook*, Central Intelligence Agency, 1987. The figures in parentheses are estimates from Freeman (1988). The U.S. figure is for 1985.

[d]Figure is for 1987 since 1988 data was not available.

Japan, Canada, and West Germany are high-wage developed countries which together accounted for 63 percent of the total U.S. trade deficit in 1988.

compensation) and unionization rates for the U.S. and 13 of its major competitors. The countries are listed in descending order of the U.S. bilateral trade deficits. With regard to wages, it is important to notice that Japan, Canada, and West Germany are high-wage developed countries which together accounted for 63 percent of the total U.S. trade deficit in 1988. The five low-wage countries, Taiwan, South Korea, Hong Kong, Mexico, and Brazil, are farther down the list and accounted for only 28 percent of the total deficit. Cheap, unskilled labor may provide a comparative advantage for some countries in some industries. It cannot, however, explain the evolving trade relations with many

developed countries, such as West Germany, Sweden, and Switzerland, that pay even higher wages than the U.S. at current exchange rates. Deficits were also run with several countries, such as Japan, Canada, Italy, and France, whose wages were within 8 percent of the U.S. average.

Even more revealing are the unionization rates listed in the final column. In comparison to its major trading partners, the U.S., with a unionization rate of 18 percent in 1985, is a relatively low union country. Only South Korea and Hong Kong fall below the U.S. unionization rate. If unionization is a disadvantage, then it is one that should have had a larger effect on Japan, Canada, and West Germany, the three countries which account for 63 percent of the U.S. trade deficit, than on the U.S. In reality, unionization rates in the U.S. are more comparable to the Bahamas (25 percent), Honduras (25 percent), and Tunisia (20 percent), than to other industrialized countries.

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Even if some U.S. goods are more costly because of union labor, part or all of this disadvantage can be offset by higher union wages abroad. As long as the effect of foreign unions on wages and their distribution across industries are comparable to the U.S., then any union disadvantage will be largely neutralized. In fact, given the higher unionization rates in Japan, Canada, and West Germany, foreign union workers are more likely to be competing with nonunion U.S. workers than vice versa. Because the U.S. has experienced the largest decline in unionization rates among major developed countries, developments since 1980 have only served to reinforce this situation (Freeman, 1988).

Industry Evidence

There is no striking evidence that imports are positively related to unions.

While unions do not appear to hurt American competitiveness in general, it can be argued that their effects are felt at the level of the individual industry. There exists a wide variation in the relative importance of imports and exports among U.S. manufacturing industries. Some have been very successful, expanding export production and fending off imports, while others have lost large shares of their domestic and international markets to foreign producers. By making inter-industry comparisons we can investigate whether unions are one of the distinguishing characteristics of industries in which the U.S. has a comparative disadvantage.

Some general observations can be made from Table 2, which summarizes the import share in 1985 for twenty major U.S. manufacturing industries. The magnitude of each industry's losses to imports, measured by the ratio of imports to domestic production, varies widely from .91 for leather and leather products (primarily shoes, boots, and purses) to zero for tobacco products. Among the most widely publicized industries, apparel suffered the third largest losses, autos fell into the fourth category (transportation equipment), and steel placed sixth within primary metal industries.

Also included in Table 2 are unionization rates for 1968 to 1972 and four-firm concentration ratios. Union data from the early 1970s is used to determine whether unions affected the growth of imports and trade deficits. Since unions themselves have been affected by trade, more recent union data would raise the issue of causality.[1] It is evident from Table 2 that, with the exception of primary metals, the unionization rates of the high-import industries were not much different from those in the sectors where import shares were minimal. At least for these broad categories, there is no striking evidence that imports are positively related to unions.

TABLE 2

Import Penetration by Two-digit Industry

SIC	Industry	1985 Import Share[1]	Union[2]	Concentration[3]
31	Leather and leather prod	91	53	27
39	Misc. manufacturing ind.	42	41	28
23	Apparel, other textile prod.	27	48	25
37	Transportation equipment	22	63	73
36	Electric, electronic equip.	20	41	47
33	Primary metal industries	19	72	44
35	Machinery, except electrical	15	41	36
38	Instruments and related prod.	14	33	49
24	Lumber and wood products	11	32	22
25	Furniture and fixtures	10	41	21
29	Petroleum, coal products	10	43	30
32	Stone, clay, glass products	08	62	36
26	Paper and allied products	08	55	31
22	Textile mill products	07	23	34
30	Rubber, misc. plastic products	07	41	29
28	Chemicals and allied products	07	43	39
34	Fabricated metal products	06	45	30
20	Food and kindred products	05	53	34
27	Printing and publishing	01	35	19
21	Tobacco products	00	59	77

[1] Imports divided by domestic production. Source: *United States Imports and Merchandise for Consumption and General Imports of Merchandise*, Census Bureau, 1965–1986.

[2] Percentage of industry workers covered by collective bargaining agreements from 1968 to 1972. Source: Freeman and Medoff (1979).

[3] Weighted average of 1972 four-firm concentration ratios for four-digit SIC industry categories. Source: *Annual Survey of Manufacturers*, Census Bureau.

Table 3 gives a sample of more detailed industries with the highest and lowest net imports in 1981. Net import shares are defined as imports less exports divided by U.S. production plus imports. Once again, trade had a wide-ranging impact, with net imports as high as 76 percent for jeweler's materials and as low as −64 percent for rice milling. The unionization rates do not appear to be systematically higher in the industries with high net imports than in the industries with low net imports (high net exports).

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TABLE 3

Net Imports by Four-digit Industries

SIC	Industry	1981 Net Imports[a]	Union[b]	Concentration[c]
Highest Net Imports				
3915	Jewelers materials, lapidary work	76	27	17
3263	Fine earthenware, food utensils	71	55	68
3021	Rubber and plastics footwear	69	52	58
2279	Carpets and rugs, nec	57	15	69
3751	Motorcycles, bicycles, and parts	56	44	66
3149	Footwear, except rubber, nec	55	27	24
3962	Artificial flowers	48	27	38
3333	Primary zinc	47	54	81
3873	Watches, clocks, and watchcases	43	35	58
2386	Leather and sheep lined clothing	42	34	16
Lowest Net Imports (Highest Net Exports)				
2044	Rice milling	– 64	35	51
3795	Tanks and tank companies	– 44	44	87
3531	Construction machinery	– 35	45	47
3721	Aircraft	– 34	40	59
2875	Fertilizers, mixing only	– 27	24	21
2874	Phosphatic fertilizers	– 27	24	35
2077	Animal and marine fats and oils	– 27	31	28
2075	Soybean oil mills	– 25	31	54
3728	Aircraft equipment	– 24	40	45
3511	Turbines, turbine generator sets	– 24	60	86

[a]Equal to imports less exports divided by domestic production plus imports. Source: FTC Report, 1987.
[b]Percentage of union production workers from 1973-75 based on the three-digit SIC industry category. Source: Freeman and Medoff (1979).
[c]For source see Table 2.

Econometric analysis clearly rejects the hypothesis that unions have a positive effect on imports.

The relationship between industry trade flows and unions cannot be measured solely by identifying simple correlations. Many other factors that can affect trade must be accounted for before the union-trade relationship can be accurately identified. The econometric method of regression analysis can be used to control for these factors in order to measure the relationship between unions and trade flows. The details of this statistical analysis are presented in the Appendix; the main results are summarized here.

The econometric analysis clearly rejects the hypothesis that unions have a positive effect on imports; either total imports or net imports (imports minus exports) expressed as a percentage of domestic supply. The econometric results also allow us to reject the hypothesis that unions have a negative effect on exports, measured as a percentage of domestic supply. Once other factors are accounted for, neither imports nor exports are significantly affected by the unionization rate.

The results confirm that imports are relatively higher in more concentrated industries.

Other implications of the econometric analysis are also of interest. The results confirm that imports are relatively higher in more concentrated industries. The reason for this is either that foreign rivals are attracted by the monopoly profits or that productive efficiency has atrophied from lack of competitive pressure. There is also the possibility that firms in concentrated industries are more likely to import materials and finished products from their foreign affiliates, essentially trading with themselves. Unfortunately, the available data do not permit any deeper probing into these possibilities. It is worth noting, however, that higher imports in concentrated industries are partially offset by higher exports, but the latter fails the test for statistical significance.

The other results tend to reinforce conventional views concerning the sources of comparative advantage for the United States. Imports are significantly higher in industries which are either labor-intensive or rapidly expanding. Imports are lower for products which are protected by tariffs or produced by high-wage industries abroad. Exports are strongest in U.S. industries characterized by workers with high education levels and by high expenditures on research and development. There is also some evidence that imports are higher in energy intensive sectors and that net imports are higher in sectors which are dependent on nonrenewable resources (excluding petroleum). These results confirm that many industry characteristics, with the notable exception of unions, are important in determining U.S. trade flows.

These results correspond well with the results of other studies.

The data for this study were largely drawn from a similar one conducted by the U.S. Federal Trade Commission (Hilke and Nelson, 1987). The FTC study differs from the one conducted here in a number of respects which are discussed in more detail in the Appendix. One key difference is that the FTC study found unions to be positively related to imports and net imports. However, the FTC also included a variable intended to measure "human capital." The human capital variable used in the FTC study is nothing more than a modified wage rate, which is naturally correlated with unions, and which is affected by many factors other than true human capital investment. The inclusion of this human capital measure human capital biases the results of the FTC study. When the FTC's variable is replaced by a more direct measure of human capital, median years of education, the positive effect of unions on imports disappears.

These results correspond well with the results of another study I conducted using slightly less detailed industry categories (three digit SIC) and controlling for a similar set of industry characteristics (Karier, forthcoming). For a sample of 135 manufacturing industries, I found that unionized industries were generally associated with lower than average imports and higher exports, although the difference was never statistically significant. Using data for twenty-seven industries in 1966, Robert Baldwin (1979) found that the extent of unionization was largely unimportant in determining whether U.S. industries were net importers or exporters with particular countries. Japan and Libya were two exceptions who had higher net exports to those U.S. industries that were highly unionized. Australia, Greece, and Thailand, however, fared more poorly against those same highly unionized industries, importing more than they exported. For the remaining twenty-two countries in Baldwin's study, the extent of unionization did not make any significant difference in the balance of trade.

The findings of this statistical examination do not necessarily correspond with popular beliefs about particular industries, such as steel. In 1983 unionization rates and wages in this industry were among the highest in the country. Yet it also lost more than 200,000 production jobs and 20 percent of its market to imports. Are unions to blame? According to a study by Grossman (1986), rising wages in the steel industry were responsible for no more than 3 percent of the employment losses from 1976 to 1983. Structural factors independent of changes in steel prices, such as lower demand for steel products, were responsible for the majority of the jobs that were lost in the 1970s. Import competition was the major source of job losses in the early 1980s, but this could be almost entirely explained by the exchange rate changes during these years.

The long-run neglect of the capital stock which characterized this traditionally concentrated industry must be added to the short-run domestic factors emphasized by Grossman. As per the results of the empirical analysis, the particular vulnerability of concentrated industries to imports may be associated with their pattern of sacrificing long-run investments in modernization for short-run profits.[2] In sum, unions should not be blamed for the ill fortunes of the steel industry when exchange rates, falling demand, and the ravages of monopoly neglect are sufficient explanations. Moreover, any explanation of steels' ill fortunes must examine not only domestic factors but external factors such as the rise of low-wage Third World competitors, foreign subsidies and industrial policies, and the inevitable catch-up in productivity.

Any explanation of steels' ill fortunes must examine not only domestic factors but external factors such as the rise of low-wage Third World competitors, foreign subsidies and industrial policies, and the inevitable catch-up in productivity.

The auto industry is another sector in which high union wages have been blamed for rising imports. In the early 1970s, union coverage of 70 percent in the auto industry was among the highest in manufacturing, and wages were 37 percent above the manufacturing average. In this same

industry, imports captured 23.5 percent of the market by 1984, with Japanese producers firmly in control of 18.3 percent. By 1989, imports captured 29.6 percent of the market with the Japanese in control of 20.3 percent.

Unions and high wages have not been responsible for the competitive disadvantage of the U.S. auto industry.

Unions and high wages have not been responsible for the competitive disadvantage of the U.S. auto industry. The U.S. deficit in automobiles remained large although the total hourly compensation of Japanese autoworkers rose from 44 percent of their American counterpart in 1980 to 76 percent in 1987. These wage differences are entirely in line with the average production wage differential existing between the two countries. In other words, compensation for U.S. autoworkers was consistent with the general wage differential existing between U.S. and Japanese workers, and therefore cannot account for a specific competitive disadvantage in the auto industry.

In any event, relative costs of production are not determined by wage levels alone; relative productivity levels must also be taken into account. Anderson and Kreinin (1981) showed that, from 1957–1977, productivity growth in the U.S. auto industry was sufficiently rapid to keep American unit labor costs (wages times hours per unit of output) from rising relative to the average for all manufacturing. Hence, they concluded that the U.S. auto industry did not suffer from a labor-cost disadvantage.

Other factors besides wages have affected our competitiveness in automobiles. The U.S. auto producers lost their absolute productivity advantage in the 1970s. This was the result not only of domestic developments but also of the rapid convergence of U.S.-Japanese productivity levels which resulted from Japanese government and private sector initiatives.

Although U.S. consumers demanded small cars, U.S. companies failed to redirect their production. Anderson and Kreinin (1981) cite this error as a primary reason for the growth of auto imports until 1980. By producing the wrong combination

of large and small cars and doing it less efficiently than their rivals, the U.S. auto companies ensured themselves of declining market shares.

The fact that U.S. auto workers are well compensated for their labor can largely be attributed to the strength of the United Auto Workers union. If there had not been a UAW, there is little reason to expect that prices would have been significantly lower or production more efficient. The historic monopoly position of the auto industry has allowed them to maintain prices, regardless of production costs. Evidence from a number of studies shows that without unions, concentrated industries would be more likely to collect higher profits than to reduce prices for the benefit of consumers (Karier, 1988; Voos and Mishel, 1986b). Further supporting this claim is the failure of the auto makers to take advantage of the falling dollar (relative to the yen) to price aggressively and build up their market share.[5]

Evidence from a number of studies shows that without unions, concentrated industries would be more likely to collect higher profits than to reduce prices for the benefit of consumers.

Foreign Expansion

While it is commonly believed that U.S. firms often go abroad in order to avoid high-wage union labor at home, the data on direct foreign investment do not generally support this belief.

Direct foreign investment (DFI) by U.S. firms in production abroad is another source of the deteriorating trade position of certain industries. By replacing U.S. exports or adding to U.S. imports, thereby displacing domestic production, DFI contributes to negative trade flows. If foreign affiliates sell their products abroad, they may replace U.S. exports, but if the products are shipped to the U.S. they are counted as imports. Relative to U.S. trade, the magnitude of U.S. foreign production is hardly insignificant. In 1982, foreign affiliates of U.S.-based companies were responsible for 22 percent of all manufacturing imports and could have easily displaced an even larger share of exports by selling directly in foreign markets. The question in point is whether or not unions are an important factor in firms' decisions to transfer production from domestic to foreign operations.

While it is commonly believed that U.S. firms often go abroad in order to avoid high-wage union labor at home, the data on direct foreign investment do not generally support this belief. As of 1986, the vast majority (69 percent) of U.S. foreign investments were in other industrialized countries, rather than in the low-wage, largely nonunion developing countries. The countries on the receiving end of U.S. investment include the United Kingdom (15 percent), Canada (14 percent), and Japan (8 percent), all of which have higher unionization rates than the U.S. (see Table 1). Investments by U.S.-based companies in these particular countries reflect more interest in gaining shares of their large consumer markets than in avoiding the costs of union labor.

Investments in less developed countries were relatively smaller but not insignificant from the perspective of the foreign country where small investments by U.S. standards often dwarf those of foreign nationals. In these countries, U.S. firms can combine the advanced technologies of the First World with the extraordinary low labor costs of

the Third World to generate unusually high profits. In these cases, a firm's interest in avoiding higher U.S. labor costs may have been at least partial motivation for foreign investments. But even here, the U.S. union wage differential, which averages 20 percent, may be largely irrelevant when compared to the overall wage differential existing between the two countries. Recall from Table 1 that the average U.S. wage ranges from six to nine times the wages in Taiwan, South Korea, Hong Kong, and Brazil—and these are not the lowest wage countries in the Third World. Consequently, unions can only marginally add to the labor-cost incentive for Third World investments.

U.S. firms can combine the advanced technologies of the First World with the extraordinary low labor costs of the Third World to generate unusually high profits.

In order to test the effects of unions on DFI in more depth, we need to begin by measuring the level of foreign economic activity of U.S. firms. This is complicated not only by the difficulties of translating from foreign to U.S. values, but also by intentional misreporting. For example, if a U.S. oil company extracts oil in a country with a low profit tax and ships the unrefined oil in another country with a higher tax rate, it has a clear incentive to elevate the transfer price of the crude oil to minimize its total tax burden. The firm's sales and net income will therefore be overstated in the first country and understated in the second. Similarly, foreign taxes based on assets or sales will create different incentives leading to other kinds of distortions. The fact that the value of particular capital goods abroad may differ from identical ones in the U.S. due to different purchase prices, exchange rates, or depreciation schedules further complicates matters. Price deflators are generally unavailable for data on U.S. foreign assets. Since no one measure is error-free, the best practice is to rely on a variety of different measures.

As was the case for imports, the level of foreign activity varies widely by industry. Table 4 shows U.S. foreign investments for twenty-two general manufacturing industries both by the share of taxable income generated by foreign affiliates in 1981 and the ratio of foreign to domestic employment in

TABLE 4

Direct Foreign Investments by U.S. Firms

SIC	Industry	Income[a] (1981)	U.S. Foreign Investments as measured by: Employment[b] (1985)	Share of U.S. Imports[c] (1982)	Union	Concentration
25	Furniture and fixtures	01	03	07	41	21
31	Leather and leather prod	02	03	—	53	27
21	Tobacco products	06	2 05	1 00	66	79
27	Printing and publishing	07	02	62	35	19
22	Textile mill products	07	05	01	23	34
39	Misc. manufacturing ind	08	16	04	41	28
23	Apparel, other textile prod	10	05	01	48	25
24	Lumber and wood products	14	03	07	32	22
30[e]	Rubber products	15	60	33	55	52
30[e]	Plastic products	15	09	01	32	07
34	Fabricated metal products	17	12	08	45	30
20	Food and kindred products	18	28	08	53	34
32	Stone, clay, glass products	21	22	10	62	36
36	Electric, electronic equip	29	34	22	41	47
26	Paper and allied products	31	23	23	55	31
38	Instruments and related prod	32	26	09	33	49
33	Primary metal industries	37	13	11	72	44
28	Chemicals and allied products	38	70	31	43	39
35	Machinery, except electrical	44	29	19	41	36
29	Petroleum, coal products	54	1 25	22[d]	43	30
37[e]	Motor vehicles and equipment	66	1 19	46	72	81
37[e]	Aircraft,ships,railroad, motorcycles,missiles	72	05	28	55	55
	Manufacturing Totals	—	**.25**	**.22**	**.47**	**.39**

[a]Ratio of taxable income by U.S.-based firms from foreign sources to U.S. taxable income. Source: FTC Staff Report, 1987.

[b]Ratio of foreign employment of U.S.-based firms to domestic employment. Sources: "U.S. Direct Investment: Operations of U.S. Parent Companies and their Foreign Affiliates," U.S. Dept. of Commerce, revised 1985, and Annual Survey of Manufacturers.

[c]Ratio of U.S. imports accounted for by U.S. foreign affiliates to total industry imports. Sources: Barker (1986) and "U.S. Imports of Merchandise for Consumption and General Imports of Merchandise," U.S. Bureau of the Census.

[d]This ratio and manufacturing total include oil and gas extraction, (SIC 13).

[e]Includes part of this SIC category.

1985. Although the two measures correspond well for most industries, there are three exceptions: tobacco and rubber, where the employment measure indicates substantially higher levels of foreign activity, and primary metals and transportation

(other than autos), where foreign activity is higher according to the income measure. In all three cases, the employment share is the preferred measure since employment is easier to count and less susceptible to cyclical variations.

Some industries, such as furniture and fixtures, printing and publishing, textiles, apparel, lumber and wood, leather, and plastics, had relatively low foreign income and employment. In each case, foreign income was 15 percent or less of its domestic income and employment was 6 percent or less. These industries are also among the least concentrated in manufacturing and have relatively low unionization. At the other end of the spectrum are key industries with substantial foreign production. The foreign operations of U.S. automakers employed more workers than their home operations and generated two-thirds as much income. The ratio of foreign to domestic employment and income ranged roughly from a fourth to a half for many other important industries including petroleum, machinery (electrical and nonelectrical), chemicals, primary metals, instruments, and paper products.

For all manufacturing industries in 1982, the affiliates of U.S.-based companies accounted for more than a fifth of all U.S. imports.

There is also the question of whether or not the products of U.S. foreign affiliates are sold abroad or shipped back to the U.S. The third column in Table 4 reports the ratio of U.S. imports shipped by U.S. affiliates to total imports for each industry. Some caution must be used in comparing these two figures since different methods were employed to collect the two sets of data. Even allowing for a high margin of error, however, the results suggest that affiliates play a major role in U.S. imports.

For all manufacturing industries in 1982, the affiliates of U.S.-based companies accounted for more than a fifth of all U.S. imports. The shares for tobacco, printing, and publishing are high but less important because imports were so low in these cases. The same cannot be said for the automobile industry, where U.S. firms' own-imports account for nearly half (46 percent) of the value of all imports. Foreign operations of the U.S. auto

companies are substantial and have been a major source of parts and semi-finished automobiles entering the country. Other industries with high shares of own-imports include rubber (33 percent), chemicals (31 percent), paper products (23 percent), electric and electronic equipment (22 percent), and petroleum (22 percent). Even in the beleaguered U.S. primary metal industry, U.S. firms accounted for 11 percent of imports. As Bulova's president, Harry B. Henshel said, "We are able to beat the foreign competition because we are the foreign competition" (Barnet and Muller, 1974, p. 305).

The greatest potential impact of foreign investment on trade flows is the suppression of exports rather than the growth of imports.

While U.S. own-imports are substantial, especially for certain industries, the vast majority of U.S. goods produced abroad are sold abroad. According to figures for 1984, only 7 percent of the value of U.S. manufactured goods produced abroad was shipped back into the U.S. (Brereton, 1986). The greatest potential impact of DFI on trade flows is the suppression of exports rather than the growth of imports.

Data limitations have hindered the investigation of why some industries invest in more foreign production than others, but the available results offer some interesting preliminary conclusions. According to Baldwin (1979), concentration is typically found to be a powerful determinant of foreign activity. Even for the general industries listed in Table 4, there is a strong, positive correlation between both measures of foreign activity and concentration: .45 for income shares and .76 for employment shares. Foreign activity is also positively correlated with U.S. unionization rates, but the relationship is weaker than that with concentration. While either factor alone would be a statistically significant determinant of foreign activity, only concentration remains significant when their effects are tested by multiple regression. The problem is that for such general industries, the correlation between unionization and concentration is simply too strong to tell whether firms are invest-

ing abroad because they are concentrated or because they are concentrated *and* unionized.

In a comprehensive analysis of U.S. foreign investment in 1982, I found no evidence that unions motivate U.S. firms to produce abroad (Karier, 1990). The tendency for some industries to pursue foreign expansion could be traced to several characteristics of the domestic market, including concentration, R&D intensity, and education levels, as well as import tariffs in the host country. But unions were not a significant factor in any of the multivariate statistical tests.

In a comprehensive analysis of U.S. foreign investment in 1982, there was no evidence that unions motivate U.S. firms to produce abroad.

The importance of concentration in determining U.S. foreign investment has been recognized by observers for some time. Due to their monopoly position at home, more highly concentrated industries generally have a larger pool of investable funds as well as more reasons to want to restrict investment in the domestic market. At least prior to the Reagan era, horizontal or vertical combinations were likely to raise serious antitrust concerns, and too much investment in their own domestic industry could undermine monopoly profits. Any increase in output would threaten to bring down prices and profits or, even worse, lead to mutually destructive price-cutting among industry leaders. Foreign investment, on the other hand, not only provides an outlet for oligopolistic surpluses, but also increases U.S. firms' shares of world markets.

It is interesting to trace the change in U.S. DFI over time. According to Department of Commerce data, the equity value of U.S. DFI rose at an average annual rate of 8.4 percent from 1966 to 1986. This significant growth showed signs of slowing during the 1980s when the rate dropped to 3 percent, primarily because of lower inflation rates (these rates are not corrected for inflation) and the recession of 1982 which suppressed investments in general; domestic and foreign. At the very least, it is safe to assume that DFI did not accelerate during the 1980s, which itself leads to two tentative but

important conclusions. First, DFI may have contributed to the declining net exports of some industries during the 1970s and 1980s, but has probably not been particularly responsible for the sharp downturn since 1983. And on a related issue, DFI may have played a role in the steady erosion of unionization rates during the past 30 years but cannot be held responsible for the accelerating decline in the 1980s.

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Summary

The purpose of this report has been to evaluate the claim that unions are responsible for some of the trade-related losses of U.S. industries. While this proposition appears reasonable on the surface, a closer examination fails to provide much support. If unionization is a disadvantage, it should be more of a concern for foreign producers, since the United States' main competitors have equal or higher unionization rates, and some of them even have higher average wages. Even if unionization were a disadvantage for the U.S., it would be a minor one since the union percentage has now sunk to its lowest level in 40 years.

The industry-level study conducted in this report also fails to substantiate the claims that unions impair U.S. competitiveness. Imports are not higher in heavily unionized industries nor are exports lower, making it difficult to blame unions for the trade problems of individual U.S. industries. Even in the case studies for steel and autos, the effects of unions are overwhelmed by many other factors.

Imports are not higher in heavily unionized industries nor are exports lower, making it difficult to blame unions for the trade problems of individual U.S. industries.

There remains the possibility that unions are indirectly linked to industry trade flows because of U.S. foreign investments. If U.S. businesses are choosing to invest abroad rather than maintain or expand domestic production because of unions, then in a sense, unions do have a negative effect on domestic net exports. However, the statistical evidence does not support this view. Any effect that unions may have is eclipsed by the more important effects of concentration, trade policies, and overall international wage differentials (which are much larger than domestic union wage differentials). A more important motivation for foreign expansion appears to be the effort of U.S. corporations to increase their shares of world markets while protecting oligopolistic positions at home.

To conclude from this study that unions are not responsible for the rapid increase in net imports does not in any way imply that imports are unre-

lated to changes in union membership. Increased imports accelerated industrial restructuring, leaving some industries with a smaller domestic workforce, heavier reliance on subcontracting, and more production facilities located in the predominantly nonunion South. This restructuring not only motivated extensive layoffs in many U.S. industries, but also provided an additional weapon for firms in reducing their exposure to unions. Under import pressure, union plants were often selected for closure because they were the oldest, most technologically backward, and in some cases, simply because they were union. Consequently, it is important to distinguish between unions as a cause of the import explosion, the theory challenged by the findings in this report, and imports as a cause of the union decline, which is less controvertible.

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Appendix

This appendix describes the econometric tests used to evaluate the impact of unions and concentration on U.S. imports and exports. Models for both imports and exports were specified and tested using data for 360 four-digit industries (Standard Industrial Classification) in 1981. Most of the data were obtained from a 1987 Federal Trade Commission Staff Report, "International Competitiveness and the Trade Deficit" (Hilke and Nelson, 1987). More specific descriptions of the data can be found in that report. An additional variable, the four-firm concentration ratio for 1977 from the *Annual Survey of Manufacturers*, was appended to this basic data set.

The models tested in this analysis are based on the original FTC study with several important differences. First, the FTC study included a large number of variables which were statistically insignificant. For example, variables identifying industries targeted for development by Japanese manufacturers and industries with relatively short shipping distances did not reveal any significant impact on trade. Consequently, these and other variables which were not significant were omitted from the statistical tests.

Two additional variables were also dropped because they were poor proxies for what they were intended to measure, as well as because they were highly correlated with other variables in the study. The first one, called "human capital intensity," is actually the product of labor intensity and a capitalization of the average industry wage. Although human capital does influence the industry wage, so do a number of other variables including unions, discrimination, monopoly power, and firm size. The FTC variable, derived from the industry wage, is no more representative of human capital than it is of unions or any of the other variables that influence wage levels. In particular, it is highly correlated with the union variable (correlation coefficient = .41) and its inclusion signifi-

cantly alters the significance of the union variable. A more direct measure of human capital is the median education level which I used in place of the FTC variable.

The second questionable variable, identified as minimum efficient scale (MES), measures "the average proportion of the market served by the largest plants making up 50 percent of industry output" (Hilke and Nelson, 1987, p. 163). In reality, the optimum scale for production will vary widely by industry and should be calculated by comparing average costs for different size plants within each industry. The simple definition employed by the FTC allows for facile calculations without any clear economic meaning. Besides, if the goal is to identify entry barriers due to economies of scale, then the measure should be in absolute terms such as the expenditure required to build an efficient plant rather than a relative measure such as the market shares of large plants. Since the FTC's measure is in terms of relative size (market shares) rather than absolute size (dollar cost), it is more of a concentration measure than a measure of economies to scale. It is not surprising that industries with relatively large plants (high MES) also tend to have relatively large firms (high concentration). Consequently, there is a very high correlation coefficient between MES and the Herfindahl index of concentration (.65) as well as between MES and the four-firm concentration ratio (.71). For these reasons, the MES variable is not included in this analysis.

Finally, the four-firm concentration ratio was used in place of the Herfindahl index. Both are measures of the degree of competition within industries and both are commonly used in empirical analyses. The difference between the two is that the concentration ratio focuses on the market shares of the four largest firms whereas the Herfindahl index is based on squaring the market shares of all firms in the industry. The choice of the four-firm concentration ratio in this study clearly places the emphasis on the market power of the largest

firms without the nonlinear effects of squaring the market shares.

Other variables included in the import model are energy intensity (the ratio of industry energy costs to value added), depleting natural resources (identified by Baldwin, 1970), labor intensity (industry labor compensation divided by value added), consumption growth (percentage change in U.S. consumption from 1972 to 1981), U.S. tariffs, and foreign pay of Japanese workers. The only additional variable introduced in the export model is research and development expenditures calculated as a percent of value added.

The results of this regression analysis are reported in Table A-1. Each of the three dependent variables (imports, exports, and net imports) is converted to a ratio by dividing by domestic supply, equal to domestic production plus imports. The coefficients presented in Table A-1 were estimated by ordinary least squares and measure the effect of each variable on imports, exports, and net imports. The *t*-statistics in italics indicate the statistical significance of each coefficient. The union effect is small and falls far short of statistical significance in every case, suggesting that unions are not an important factor in regulating trade flows.

Additional regressions were run to evaluate the potential effect of multicolinearity between concentration and unions on the coefficients. For each of the three trade measures, the union and concentration variables were alternately omitted to see if omitting one had any effect on the coefficient of the remaining one. All the variables from Table A-1 were included in the tests, but only the coefficients for unions and concentration are reported in Table A-2. Multicolinearity does not appear to be a problem since the estimates are hardly affected by omitting one of the variables. This is consistent with other studies which find that multicolinearity between these two variables is much less severe when four-digit industry data are used.

TABLE A-1

Regressions on 1981 Trade Measures
360 Four-digit SIC Industries

Independent Variable	Dependent Variable: Imports[a]	Exports[b]	Net Imports[c]
Unions	05	-.02	04
	.80	*.53*	*.53*
Concentration	07*	03	04
	2.13	*1.13*	*1.07*
Energy Intensity	001*	—	001
	1.89	*1.57*	
Depleting Resources	05	-.20	09**
	1.56	*-1.20*	*2.39*
Labor Intensity	14**	-.05	18**
	2.55	*-1.27*	*2.68*
Consumption Growth (1972–1981)	04**	—	03*
	2.71	*2.05*	
U.S. Tariffs[d]	-.61**	—	-.61**
	-2.01	*-1.76*	
Foreign Pay	-.02**	—	-.02**
	-3.64		*-4.00*
Median Education	-.002	.015*	-.01
	-.23	*2.24*	*-.98*
Research & Development	—	.004**	-.004**
		4.11	*-2.00*
Intercept	.11	-.11	.20
	.95	*-1.27*	*1.35*
R^2	.09	.14	.15

Note: *t*-statistics are in italics.
[a]Ratio of imports to domestic production plus imports.
[b]Ratio of exports to domestic production plus imports.
[c]Ratio of imports less exports to domestic production plus imports.
[d]Tariffs multiplied by one million.
*Significantly different from zero at the 5% level.
**Significantly different from zero at the 1% level.

TABLE A-2

Tests for Multicolinearity Between Unions and Concentration

Dependent Variable	Unions	Concentration
Imports	07	—
	1.24	
	—	08*
		2.33
Exports	03	—
	.83	03
	—	
		1.30
Net Imports	05	—
	.80	05
	—	*1.23*

Note: *t*-statistics are in italics.
Source: Author's calculations.

Endnotes

[1] It is important to note that unionization rates were falling for a long time *before* import shares rose in many U.S. industries. The union share of the private labor force peaked at 38 percent in 1954, at a time when imports were only 4 percent of GNP and the balance of trade was in surplus. The overall unionization rate had fallen to 23 percent by 1980.

[2] Commenting on the record number of steel plants closed after 1977, Walter Adams and Hans Mueller (1986) claimed that "[S]ome of the plants that were partially or completely closed were originally built in the last century. Although their technology and scale had been updated to some extent, many of their structural features—such as location and flow of materials—reflected the best-practice standards of a bygone era." (p. 83) In his study of the U.S. steel industry, Karlson (1986) found that 19 out of 48 steel plants in his sample had failed to adopt either the basic oxygen or large electric furnace technology as late as 1980.

Karlson argues that steel producers were justified in waiting to invest in basic oxygen furnaces and large electric furnaces until these new technologies had reached a sufficiently large scale. But the scale was determined by their own investments in developing the new technology. Thus Karlson's justification is circular: the steel industry did not invest in the new technologies because they had not yet invested enough in them.

[3] Kwoka maintains that the automakers "deliberately kept prices high enough to permit continued imports, because by doing so they maximized their profits" (quoted in Nader and Taylor, 1986). Bussey (1988) noted that, even with the dollar falling from 240 yen in the mid 1980s to nearly 120 yen in 1988, Detroit failed to recover any lost market share. In fact, the market share of domestic producers fell to 69.9 percent as the "[B]ig three automakers aggressively raised prices right behind the Japanese in a determined—and remarkably successful—effort to increase profits."

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